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The Role of Fundamental and Technical Analysis

Chapter Objectives:

- study the direct relationship between fundamental and historical volatility
- develop an efficient method for calculating historical volatility
- compare the advantages of historical volatility to the problems of implied volatility
- reveal the correlation between fundamental volatility and stock price behavior
- analyze the comparisons between fundamental volatility and options risk
- rate proximity with a point system to appreciate the probability of success.

Fundamental volatility (defined as trends in financial outcomes for a company) directly and at times significantly impacts a stock's historical volatility and, as a result, options status as well.

This claim might surprise many options traders, who tend to dismiss fundamental analysis as backward-looking and of no value in (a) selecting specific trading strategies; (b) identifying volatility or risk levels; and (c) establishing realistic profit expectations. This chapter reveals how and why fundamental volatility is part of the equation for determining option volatility and the timing of trades.

Analyzing the Impact of Fundamental Volatility

The rejection of the fundamentals among options insiders overlooks a significant source of intelligence for the timing of trades and an opportunity to expand the overall understanding of market risk. A mathematical analysis of key fundamental signals reveals a correlation between long-term fundamental volatility and the options market. Thus, the selection of a company and its stock as a vehicle for options trading can be shown to rely on fundamental analysis as a starting point and, ultimately, as an influence on volatility in both stock and option prices. If a trader is intent on building a portfolio of value investments and then hedging market risk with options, awareness of fundamental trends identifies volatility tendencies within the options market.

In the context of pricing for both stocks and options, “fundamental volatility” refers to a tendency in a company’s financial statements to display varying levels of predictability. Thus, the financial trends observed in revenue, earnings, long-term debt, dividends, and P/E ratio are examples of fundamentals that define levels of financial stability and predictability.

However, in literature analyzing markets, the term “fundamental volatility” may also refer to *economic* fundamentals including GDP, consumption and other measurements. These macroeconomic variables are not associated directly with the correlation between a company’s reported profitability or cash management, however. In the analysis that follows, “fundamental volatility” is a description of financial trends over time, with a study of how these trends relate to stock trends as well as option pricing. Even though the economic and financial definitions of volatility are dissimilar, the conclusions are worthwhile: The relationship between a company’s financial trends (fundamentals) and stock price trends (technical) is correlated, and this presents a crucial element in selection and timing of stock investments and option trades.

However, a problem persists in the methods used by traders within the options market. These traders tend to rely solely on technical indicators associated with stock price behavior (technical analysis) and estimates of future option value (implied volatility), while ignoring and discounting the value of fundamental volatility of financial trends and its effect on historical volatility of stock prices. This discounting of fundamental volatility occurs in spite of the direct correlation between price behavior and fundamental volatility. As one study discovered, accounting trends

... exhibit incremental predictive power with respect to future option returns above and beyond what is captured by implied and historical stock volatility, suggesting that the options market does not fully incorporate fundamental information into option prices.¹

A related problem to this discounting features in the options market is a tendency for reduced levels of pricing efficiency, compared to the more immediate discounting within the stock market. While stock price behavior is assumed to be informationally efficient (meaning information is taken into price and discounted immediately), the same is not necessarily true in the options market. Informational efficiency means that stock prices react immediately to information (both true and false); however, a distinction has to be made between the long-term impact of fundamental volatility and the short-term impact of technical price volatility of stocks. To the extent that these factors affect option valuation, the fundamentals tend to define equity value over the long term, and this in turn serves as a starting point in selecting equity investments for inclusion in an options-based hedging program.

The efficiency or lack of efficiency in options pricing behavior is apparent in comparisons between stock investment versus options leverage; and differences in volume levels between the two:

On one hand, the leveraged nature of option contracts attracts sophisticated investors who wish to exploit public and private information. On the other hand, several institutional features of the options market make it less efficient than the stock market. For example, an option contract based on a firm's stock typically has considerably lower trading volume than the stock itself.²

Yet another factor in the exchange between fundamental volatility and options pricing is related to earnings surprises and changes in management guidance. The impact of both positive and negative earnings surprises is immediate and easily observed in stock charts. For example, in late February, JC Penney (JCP) experienced a positive surprise of 72.3% above expectations. The price gapped higher and was strongly confirmed by a volume spike and momentum moving into the "overbought" index range (Fig. 2.1).

The immediate impact of earnings as a fundamental indicator on the technical behavior of price is one example of how the fundamentals affect the technicals, in this case immediately. The clear reversal signals mark the logical point for entering trades, and options traders relying on chart analysis improve their timing by observing these reversal and confirmation signals. However, the analytical aspects of stock price behavior are only the first



Fig. 2.1 JC Penney—chart courtesy of [StockCharts.com](https://stockcharts.com)

step in relating the same level of news to options trading and, specifically, in how that shows up in volatility. In fact, many studies have concluded that closely related to earnings, management's guidance concerning future revenue and earnings forecasts also has a direct effect on the volatility of options, which should come as no surprise. Options implied volatility (IV) as well as a stock's historical volatility (HV) is related directly to news released about the underlying corporation. One study reported that "the implied volatility values increase after managerial forecasts, particularly when the forecast conveys bad news."³

Earnings surprises and changes in guidance forecasts are immediately observable, but these are not the only fundamentals that can be traced to technical price behavior. For example, announcements concerning dividends (declared, raised, lowered, or skipped) are fundamentals directly impacting stock price volatility and as a result, options volatility. A corporation's "decision to pay a dividend signals a commitment to maintain that dividend, implying a level of stability in the firm's operations. Thus, managers can use a dividend to signal lower fundamental volatility."⁴

This rationale may overstate the impact of fundamental influence, even in regard to dividend news. The point remains, however, that such an announcement has implications for fundamental volatility levels in the future. This change must be expected to also be reflected in historical volatility of the stock.

The relationship between fundamental news and trends, and the consequential options volatility, is not apparent to all, and is taken for granted by many options traders. However, it is also possible to demonstrate through analysis of fundamental volatility over many years that a very direct correlation exists between the fundamental and the technical. The question remains, once this correlation is observed, whether to rely on options implied volatility, or on stock historical volatility. The flaws of reliance on implied volatility were examined in detail in Chap. 1. With these flaws in mind, reliance on historical volatility provides a more reliable and more accurate measurement of options price risk and opportunity.

Calculating Historical Volatility

Historical volatility is based on daily stock prices at closing. The calculation reveals the standard deviation of net returns from one day to the next, and annualized over the full year.

Options traders may equate fundamental volatility with stock price historical volatility with a high degree of accuracy. An analysis of long-term trend in each proves this point. This direct correlation makes a compelling case for identifying levels of historical volatility to better understand option volatility as a defining factor in risk for options strategies.

To demonstrate how fundamental volatility of a company and historical volatility of stock prices are closely related (and as a result, also affect an option's implied volatility), consider the following example:

Historical volatility over 10 days: A stock has traded over the last 10 days with the following closing prices: \$105.58, 107.05, 110.44, 109.88, 110.51, 110.32, 111.32, 110.16, 110.57, and 111.88. To calculate historical volatility, use the following formula in an Excel spreadsheet:

Column A—enter each day's closing price (in the preceding example, 10 consecutive trading days were used).

Column B—calculate the daily net change (divide each day by the prior day, and subtract 1).

Column C—multiply Column B by 100. Formula is = **SUM(C1 * 100)**
Copy and paste to other cells

Table 2.1 Excel formula, calculation of historical volatility—prepared by the author

(A) Closing price each day	(B) Return (divide each day by prior day) = $SUM(A2/A1) - 1$	(C) Multiply column B by 100 = $SUM(C1 * 100)$	(D) Standard deviation = $STDEV(C1:C10)$	(E) Annualize = historical volatility = $SQRT(252) * D10$
105.58				
107.05	0.0139	1.39		
110.44	0.0317	3.17		
109.88	-0.0051	-0.51		
110.51	0.0057	0.57		
110.32	-0.0017	-0.17		
111.32	0.0091	0.91		
110.16	-0.0104	-1.04		
110.57	0.0037	0.37		
111.88	0.0118	1.18	1.30	20.68%

Column D, last 10—calculate the standard deviation of Column C. The formula to enter into D10 is: = **STDEV(C1 : C10)**

Column E, row 10—annualize the standard deviation based on average trading days per year of 252. This is the square root of standard deviations. The formula for cell E10 is:= **SQRT(252) * D10**¹

This set of calculations is summarized in Table 2.1.

In this example, historical volatility is determined to be 20.68%. As a relative value, compare this to volatility at different times over similar periods, or to other stock price movement to judge the market risk of stock (and as a result, to also time entry and exit of options trades).

The value to options traders in the use of standard deviation to quantify historical volatility becomes of greatest value when the outcome is extreme: “The standard deviation is a simple but useful measure of volatility because it summarises the probability of seeing extreme values of return. When the sample standard deviation is large, the chance of a large positive or negative return is large.”⁵

The Problem with Implied Volatility

To compare historical volatility of a stock to implied volatility of an option is a comparison of two entirely separate matters. It is not enough to assume that these are different calculations of the same matter, because they are not. Historical volatility is derived from specific and readily observed closing stock prices and their statistical analysis. Implied volatility is based on estimates of where *future* volatility should be, given a set of assumptions that might or might not be accurate.

The widespread reliance on implied volatility (IV) in the options industry leads to the assumption that volatility leads price, when in fact it is the opposite. IV is nothing more than a sentiment indicator meant to demonstrate the market’s perception of future volatility (but not direction of premium movement).

The calculation combines five segments of the Black-Scholes pricing model (see Chap. 10). These are the current option premium, the current stock price, the strike, time to expiration, and the assumed risk-free interest

¹The calculated standard deviation is based on an average of 252 trading days per year. This is the term used to arrive at the annualized percentage of volatility.

rate. By adjusting the risk-free interest rate, different volatility levels can be accomplished.

The risk-free interest rate is an interesting concept. This is an assumed theoretical rate that can be earned with no risk of loss. To the extent that it is used in option pricing models, it is the assumed rate of return an investor could earn elsewhere if investing in different instruments. This usually translates to reliance on U.S. Treasury bond rates as “risk-free,” even though the credit rating of U.S. government obligations was downgraded in 2011 and various agencies also downgraded Treasury debt in the years following.⁶

The downgrade of credit for U.S. debt changes a definition of risk-free. In the past, the “full faith and credit of the United States government” was the best guarantee available and conformed to a generally accepted definition of risk-free. However, since this entire discussion is based on a theoretical model, the downgrade has to be taken into consideration in determining whether or not U.S. Treasury securities truly are risk-free.

A practical definition of “risk-free” is elusive. Some economists have observed that risk is impossible to forecast, and thus, a risk-free rate cannot be directly observed or quantified.⁷ In other words, any formula relying on a risk-free interest rate is based on guesswork and estimation, and not on specific or known interest rates.

A comparison between a calculated implied volatility and historical volatility is problematical. Large differences in the two calculations are meaningless as one (IV) is based on estimates and the other (HV) is based on known quantities in stock prices. If the purpose is to verify IV by analyzing a comparative outcome for two dissimilar calculations, why perform IV at all? With the inherent certainty of historical volatility, the bigger question should be whether it serves as a reliable indicator of market risk for options trading.

Implied volatility does not rely only on the sole variable of risk-free interest. It also relies on the variability of the underlying stock and the price of the option. As these are fixed values at the moment of the calculation, assumptions of future movement add exponential doubt to the accuracy of IV for determining the likely trend in an option's price.

Implied volatility also relies on a calculated premium value of options, the result of the bid/ask spread (difference between premium paid by buyers and credit received by sellers). The average of these two, the mid-price is commonly used in option pricing models such as Black-Scholes. Clearly, however, the fair price of an option depends on whether a trader is long (buying) or short (selling). The mid-price is merely an average of the two, and its use is inaccurate because buyers and sellers look at different sides of the pricing

ledger. The larger the bid/ask spread, the greater the distortion in the pricing model. One study noted the misleading application of mid-price values in pricing models:

Existing literature typically uses the quoted bid-ask midpoint as the option premium, but I show that small price movements in very low-priced options can lead to large percentage increases in the bid-ask midpoint, while these price movements are still in fact less than the bid-ask spread itself. Therefore, in many cases, using the bid-ask midpoint as the option premium leads to a large positive return, while using the original ask and the subsequent bid leads to a negative return. One can debate the correct methodology, since trades are often struck between the bid and ask quotes. However, I argue for including the bid-ask spread for a realistic picture and note the dramatic effect this has on options returns.⁸

The most justified use of IV is that it measures market sentiment about option pricing and determines whether volatility is likely to rise or fall (based on the risk-free interest rate and other assumptions). The estimates further allow for calculation of probability that strike prices will be reached by stock price by expiration. Option traders may take comfort in being able to determine levels of probability in outcomes. However, since IV is based on perceptions and estimates, the calculation itself is questionable.

Fundamental Volatility Correlated to Stock Price Behavior

The flaws in implied volatility are easily revealed, especially in comparison to the readily quantified benefits of historical volatility. Beyond that comparison, the correlation between a stock price's historical volatility, and fundamental volatility of the organization, further supports the use of a two-pronged methodology: reliance on fundamental volatility and analysis to select stocks appropriate for options trading, and the use of historical volatility to time entry and exit.

The term "fundamental volatility" describes either macroeconomic factors or a company's financial trends; it also is used to describe credit risk and return on investment in assets. However, regarding options trading, fundamental volatility most accurately is related to the tendency of reported fundamental results over time to be more or less predictable. In an organization whose revenues and earnings are consistent over a decade, fundamental

Table 2.2 Fundamental outcomes, 10 years—prepared by the author

Year	Revenue (\$ mil)		Earnings (\$ mil)		Debt cap ratio	
	WMT	JCP	WMT	JCP	WMT	JCP
2016	482,130	12,625	14,694	−513	30.7	76.9
2015	485,651	12,257	16,078	−771	31.5	73.3
2014	476,294	11,859	15,878	−1388	32.5	60.9
2013	469,162	12,985	16,999	−985	30.5	47.5
2012	446,950	17,260	15,766	−152	34.7	40.4
2011	421,849	17,759	15,355	378	33.9	36.2
2010	408,214	17,556	14,414	249	30.1	36.7
2009	405,607	18,486	13,254	567	30.0	45.8
2008	378,799	19,860	12,884	1105	29.1	34.1
2007	348,650	19,903	12,178	1134	32.5	41.2

Source S&P Stock Reports

volatility is low. In another organization with erratic increases and decreases in these outcomes each year, fundamental volatility is high.

The levels of fundamental volatility (in the sense of financial trends reported by the company on its income statement and balance sheet) can be observed by comparison. Investors naturally tend to seek out companies whose fundamental results are predictable and steady over time. Using three tests of volatility (revenues, earnings, and debt capitalization ratio), the relative level of year-to-year fundamental volatility is observable. For example, comparing Wal-Mart (WMT) to J.C. Penney (JCP), annual fundamental volatility in these three results is revealing, as summarized in Table 2.2.

On this table, the differences in fundamental volatility are glaring. To express the degree of change in outcomes from year to year, subtract each year's total from the previous year; and then calculate the percentage of change. The formula:

$$(C - P) \div P = \%$$

C current year

P past year

% percent of change

For example, Wal-Mart's 2016 revenue of \$482,130 (in millions) and the 2015 result of \$485,651 are used to calculate the percentage of change with this formula:

$$(\$482,130 - \$485,651) \div \$485,651 = -7.3\%$$

Applying this formula for each year, the annual percentage of increase or decrease can then be expressed on a table and compared between companies. Table 2.3 compares revenue, earnings and debt capitalization ratio changes between Wal-Mart and J.C. Penney.

The differences, based on these trends, point out that as a measurement of risk, the mathematical calculation of annual percentage changes of key fundamental indicators adds to the understanding of how fundamental volatility directly affects a stock's historical volatility. In viewing the percentage of annual changes from year to year, to the stock price history, the correlation is evident, although not always direct. The Wal-Mart 10-year chart in Fig. 2.2 traces the prices from one year to the next, with revenue percentage changes indicated for each year. The overall trend reveals a growing price per share over the decade, accompanied by single-digit changes (all but the last year on the positive side) for the same period.

In comparison, J.C. Penney experienced much greater volatility. The price chart for 10 years is overlaid with changes each year in revenues, as shown in Fig. 2.3.

In the comparison between Wal-Mart and J.C. Penney, the differences are observable. Whereas WMT experienced positive revenue growth over a decade, JCP was on the decline. While the correlation is not exact, the overall relationship between fundamental volatility and stock price behavior appears on each chart. This outcome supports the argument that historical volatility and fundamental volatility are aligned more so than any connection established via the estimates of option prices based on implied volatility. As one in-depth study concluded, implied volatility tends to lack predictability, notably when it deviates excessively from the more precise outcome of historical volatility. In both forms of analysis, volatility tends to quickly revert to the mean, so expanded levels are likely to lead to distorted estimates in implied volatility. The reflection between fundamental history and historical volatility is a reliable method for stock selection among options traders, and also as a test of risk levels in the stock (which also translates to risk levels in the associated options).⁹

Fundamental volatility can be tested and compared to stock price trends in many different ways. The previous example was based on revenue trends over a decade. Another method involves the analysis of dividend trends (see Chap. 4). Those companies whose dividend is raised every year for at least 10 years (so-called "dividend achievers") tend to also report growing stock price levels over the same period—assuming that other fundamentals also support this level of growth. For example, as long as the debt capitalization ratio remains steady or declines, the increased dividend per share clearly is

Table 2.3 Change comparisons, WMT and JCP—prepared by the author

Year	Revenue change	
	WMT (%)	JCP (%)
2016	−7.3	3.0
2015	2.0	3.4
2014	1.5	−8.7
2013	5.0	−24.8
2012	6.0	−2.3
2011	3.3	1.2
2010	0.6	−5.1
2009	7.1	−6.9
2008	8.6	−0.2

Year	Earnings change	
	WMT (%)	JCP (%)
2016	−8.6	33.5
2015	1.3	44.6
2014	−6.6	−40.9
2013	7.8	−548.0
2012	2.7	−140.2
2011	6.5	37.0
2010	8.8	−56.1
2009	2.9	−48.7
2008	5.8	−2.6

Year	Debt capitalization ratio change	
	WMT (%)	JCP (%)
2016	−2.5	4.9
2015	−3.0	20.4
2014	6.6	34.9
2013	−12.1	17.6
2012	2.4	11.6
2011	12.6	−1.4
2010	0.3	−19.9
2009	3.1	34.3
2008	−10.5	−17.2

a positive fundamental trend. However, if the dividend increase is accompanied by an increased in the debt capitalization ratio (long-term debt as a percentage of total capitalization), the overall picture is extremely negative.

Price and revenue history, Wal-Mart



Fig. 2.2 Price and revenue history, Wal-Mart—chart courtesy of StockCharts.com

Price and revenue history, J.C. Penney



Fig. 2.3 Price and revenue history, J.C. Penney—chart courtesy of StockCharts.com

Bolstering dividends by acquiring higher long-term debt is a negative fundamental indicator.

The value of fundamental signals of many types, especially when correlated with historical volatility, provides stronger predictive intelligence concerning option risks than the less reliable estimates inherent in implied volatility. Another study based on analysis of option straddles confirmed this correlation, concluding that because

... fundamental signals contain information about future straddle returns that is incremental to what is captured in historical volatility, we expect higher hedge returns by combining historical volatility with fundamental signals ...¹⁰

The Effect of Fundamental Volatility on Options Risk

Beyond the strongly observed correlation between fundamental volatility of a company and historical volatility of its stock price, it follows that a secondary question should be asked: Does fundamental volatility transfer into similar degrees of options risk?

This is an essential question given the widespread reliability on implied volatility to define options risk. Because IV is a flawed estimate of *future* risk levels, it does not provide any reliable measurements of actual options risk, only a flawed projection. So this leads to the question of how options risk should be defined. A strong case argues that historical volatility, especially when analyzed within a probability matrix such as Bollinger Bands, is a strong volatility measurement. (See Chap. 1.) Beyond that, the fundamental volatility of the company has a direct influence on option risk, just as it has been shown to directly influence historical volatility. Bollinger is based on the spread of two standard deviations, both above and below the middle band, so this version of historical volatility is broader than the alternative, normally based on a single standard deviation.

As a starting point, many studies have noted the effect of options on underlying stock prices. As options activity has been shown to influence a stock's price, the relative safety (volatility level) of options trades are correlated with not only the stock price but also with the fundamental volatility in the company. This interaction is unavoidable given the strong association between fundamental and historical volatility.¹¹

Another analysis of this question noted the clear association between fundamental volatility and market risk:

Our study proposes that fundamental volatility may be the correct measure of risk for the total market. Changes in fundamental volatility rather than observed volatility may be more appropriate for market regulators when they investigate the systematic effect of the introduction of derivatives on the market or the current state of the market. Regulators who currently compute the risk-neutral density of returns implied by option prices may wish to consider our procedure as a complimentary calculation to assess changes in the riskiness of markets.¹²

This observation concerning the nature of market risk is profound. To many options traders, the choice between fundamental analysis and technical analysis is a binary decision. A majority rejects fundamental analysis as dated and of no use in determining options risk. However, once it becomes apparent that fundamental volatility is correlated directly with historical volatility and, by association, with option pricing and risk, the value of fundamental analysis—even within the options market—is unmistakable.

The connection between fundamental trends and stock price behavior (historical volatility) has been observed through longer time periods as well. Plotting standard deviation of New York Stock Exchange-listed stocks revealed the highest levels of volatility were between 1929–1939 and during October, 1987. At these times, the same study concluded that stock market historical volatility was high in relation to fundamental values of companies.¹³

The reliance of historical volatility and its association with fundamental trends is clearly superior to any attempt at forecasting future volatility for options. This becomes important because over many years, attempts to develop accurate methods have failed:

Despite their sophisticated composition, the predictive power of most volatility forecasting models is continually failing to convince investors of their designer's claims. Thousands of academics have devoted their entire careers to publishing models that supposedly are able to forecast volatility. Some authors have published well over 40 papers on this very topic ... and yet none seems to deliver any improvement over the simple standard deviation.¹⁴

The Proximity Factor

The use of historical volatility, calculated with the use of standard deviation, helps options traders to skillfully time trade entry and exit. However, another aspect to this requires yet another observation. The *proximity* of the current stock price to resistance or support increases the likelihood of reversal. There are five elements involved in this:

- historical volatility, with high levels favorable to reversal
- duration and angle of the trend, with stronger trends leading to stronger reversals
- strength of reversal and confirmation
- multiple confirmation
- price gapping to take price above resistance or below support

To reduce these five elements to a single statement:

Reversal of price is most likely when historical volatility is high, when the duration and angle of the current trend is strong (fast price movement, sharp angle), when reversal signals are exceptionally strong and confirmed with equally strong signals (multiple signals is desirable), and especially when price gaps through resistance or support.

This description of ideal proximity encompasses all of the required elements: volatility, price, trend, reversal and confirmation. It is difficult to quantify, however, because the phenomenon varies with each stock and with its chart scale. A patient options trader recognizes the opportunity to exploit trends when all of these elements are present. Reversal should be timed in one of two ways. First, if the same elements as above appear indicating reversal in the opposite direction, the original trade should be exited and a new trend entered (replacing a bullish with a bearish trade, or a bearish with a bullish). Second, if a predetermined profit goal is reached. For example, if you are able to double the net value of the initial trade or accomplish a pre-set dollar amount of profit, a closing trade should be entered. After that, seek new proximity factors to enter a new trade.

Even though this set of elements is difficult to quantify, the set of requirements can be set up with a simplified mathematical evaluation in order to establish relative proximity values between two or more stocks. Table 2.4 provides guidance for this type of system.

While the selection of a rating for each of these elements is subjective, application to two or more situations overcomes the problem of dissimilar attributes on various charts and price patterns. For example, applying this test to two retail companies, Wal-Mart and J.C. Penney, reveals differences in the quality of proximity. The comparison is validated by applying the same standards to both stock charts.

The chart for Wal-Mart is shown in Fig. 2.4.

On this chart, a strong price move occurred in the third week of May. The price dropped well below the established trading range immediately before earnings were announced, in spite of two strong bullish candlestick signals. The overall signal value for this strongly pointed to the likelihood of a bullish reversal.

Applying the proximity ratings test, the results are summarized in Table 2.5.

Table 2.4 Rating system for proximity trade timing—prepared by the author

Description	Rating
<i>Historical volatility:</i>	
Highest, past 6 months	4
Highest, past 3 months	3
Trending higher	2
Not trending higher, or low	1
<i>Duration and angle of trend:</i>	
Rapid trend with sharp angle	4
Moderate momentum with medium angle	3
Slow momentum with low angle	2
Very slow momentum with very low angle	1
<i>Strength of reversal and confirmation:</i>	
Exceptionally strong signals	4
Moderate signals	2
Reversal without confirmation	0
Contradictory signals	−1
<i>Multiple confirmation:</i>	
3 or more confirmation signals were found	4
2 confirmation signals were found	2
1 confirmation signal was found	0
No confirmation signals were found	−1
<i>Price gapping outside of trading range:</i>	
Strong gapping move	5
Reversal occurs at resistance or support	3
Reversal occurs on approach to borders	1
Reversal occurs at the trend's mid-range	−1

Historical volatility adjusted to two standard deviations, expressed by way of the Bollinger Band width, was at three points. This was not high volatility, but was trending higher at that moment, thus justifying a 2-point rating.

The duration and angle of the trend was also given a 2-point rating based on the very slow move of the trend and its low angle.

Reversal and confirmation was exceptionally strong with a combination of two candlestick bullish reversals in close proximity to one another. These set up strong confirmation and result in the 4-point rating. The multiple confirmation added another 4 points.

Finally, the strong gap below the trading range set up an equally strong reversal, justifying the 5-point rating in the last category.

Wal-Mart stock chart



Fig. 2.4 Wal-Mart stock chart—chart courtesy of [StockCharts.com](https://stockcharts.com)

Added together, the 17 points out of a possible maximum of 21 represents an 81% reversal confidence:

$$17 \div 21 = 81\%$$

The system works well. Had this been applied at the moment the reversal occurred (on May 18 when the single gap below trading range and before formation of the morning star), the resulting bullish reversal was more likely to be anticipated and acted upon. The expanded chart, showing the next price move, is shown in Fig. 2.5.

In this example, the overall proximity strength combining all of the signals was calculated out to 81% confidence level and, as the subsequent price movement revealed, the results occurred as expected.

The same process could have been applied to the chart of J.C. Penney, shown in Fig. 2.6.

The point of interest on this chart is close to the end of the chart. Price gapped above resistance. However, the rising wedge is a weak bearish reversal,

Table 2.5 Rating system, Wal-Mart—prepared by the author

Description	Rating
<i>Historical volatility:</i>	
Highest, past 6 months	
Highest, past 3 months	
Trending higher	2
Not trending higher, or low	
<i>Duration and angle of trend:</i>	
Rapid trend with sharp angle	
Moderate momentum with medium angle	
Slow momentum with low angle	2
Very slow momentum with very low angle	
<i>Strength of reversal and confirmation:</i>	
Exceptionally strong signals	4
Moderate signals	
Reversal without confirmation	
Contradictory signals	
<i>Multiple confirmation:</i>	
3 or more confirmation signals were found	4
2 confirmation signals were found	
1 confirmation signal was found	
No confirmation signals were found	
<i>Price gapping outside of trading range:</i>	
Strong gapping move	5
Reversal occurs at resistance or support	
Reversal occurs on approach to borders	
Reversal occurs at the trend's mid-range	

and momentum is less than one point in the overbought region; so reversal signals are present but not strongly.

The rating for this situation is summarized in Table 2.6.

The stock trended higher, and was given a 3 rating based on the 3-month price history. Momentum is considered moderate and, even with the rapid jump above resistance, the larger bullish trend was moderate, thus the rating of 3 for the trend. The reversal lacked strong confirmation, so the strength was judged to be a 2-point rating. The confirmation signal was minimal, so multiple, confirmation was discounted and only 1 point was assigned. Finally, gapping action was strong so the final section was rated as a 5.

Overall, this adds up to 14 out of a possible 21 points:

Wal-Mart stock chart, expanded



Fig. 2.5 Wal-Mart stock chart, expanded—chart courtesy of [StockCharts.com](#)



Fig. 2.6 J.C. Penney stock chart—chart courtesy of [StockCharts.com](#)

Table 2.6 Rating system, J.C. Penney—prepared by the author

Description	Rating
<i>Historical volatility:</i>	
Highest, past 6 months	
Highest, past 3 months	3
Trending higher	
Not trending higher, or low	
<i>Duration and angle of trend:</i>	
Rapid trend with sharp angle	
Moderate momentum with medium angle	3
Slow momentum with low angle	
Very slow momentum with very low angle	
<i>Strength of reversal and confirmation:</i>	
Exceptionally strong signals	
Moderate signals	
Reversal without confirmation	2
Contradictory signals	
<i>Multiple confirmation:</i>	
3 or more confirmation signals were found	
2 confirmation signals were found	
1 confirmation signal was found	1
No confirmation signals were found	
<i>Price gapping outside of trading range:</i>	
Strong gapping move	5
Reversal occurs at resistance or support	
Reversal occurs on approach to borders	
Reversal occurs at the trend's mid-range	

$$14 \div 21 = 67\%$$

The outcome of 67% confidence was far lower than the Wal-Mart case, at 81%.

Based on these results, Wal-Mart's price advanced as anticipated by the bullish signals as well as the ratings system. In comparison, JCP moved up during August to \$11.25 but declined by late September below \$10 per share.

The proximity factor, expressed through the 5-part ratings system, works to a degree in anticipating the likelihood (but not the certainty) of short-term price trends. For options trading, this quantification of the probability for accurate forecasting improves the likelihood of well-timed trades.

Analysis of the underlying chart with the known valuation of historical volatility provides a compelling case for the timing of trades, and definitely more so than with the use of implied volatility. The next challenge is to determine and compare the pricing of options on a reasonable basis. Chapter 3 explores this topic.

Chapter Summary:

- the direct relationship between fundamental and historical volatility is easily proven
- historical volatility can be calculated with a simplified Excel worksheet formula
- historical volatility is precise, whereas implied volatility attempts to estimate future values
- fundamental volatility and stock price behavior are correlated directly
- fundamental volatility is further correlated to options risk
- proximity and the use of a rating system defines the probability of trading success.

Notes

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